The Crude Truth: Exploring Oil Sanctions Evasion and the Urgent Need for Comprehensive Data

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Introduction

On 17 November 2022, the United States sanctioned an international network of thirteen companies based in the United Arab Emirates, Hong Kong, and China for being in violation of US sanctions on Iran by smuggling petroleum and petrochemical-based products. This vast and intricate smuggling ring was able to facilitate hundreds of millions of dollars worth of oil sales to buyers in East Asia on behalf of a variety of state-owned Iranian oil companies from 2020-2022. The companies used a variety of complex fraudulent activities to perpetrate these sales. Several companies acted as fronts for sanctioned companies, allowing buyers to purchase oil from the front companies and thereby hide their connections with sanctioned Iranian oil companies such as the Persian Gulf Petrochemical Industry Company (PGPIC). Other business partners altered invoices to avoid anti-money-laundering controls. Although the United States Department of Treasury's Office of Foreign Assets Control (OFAC) was able to untangle the web and uncover this illicit activity, there are hundreds of other cases of sanctions evasion that have yet to be discovered. This one case demonstrates how complicated the oil-smuggling network around the world is today and shows the importance of working to uncover sanctions evasion in order to enforce sanctions.[1]

Initially, when trying to find an appropriate topic for my honors thesis, I decided that I wanted to research how oil imports have changed as a result of Russia's 2022 invasion of Ukraine. However, while doing preliminary research on oil imports and exports, I noticed something interesting—when examining China's reported oil imports, I noticed that they had

[1] N.A. (2022). U.S. Sanctions Oil Smuggling Network. *The Iran Primer*. United States Institute of Peace. (17 November 2022).

gone *down* in the past year. This seemed counterintuitive because China's demand for oil had not decreased, and its internal supply had not increased. Therefore, its imports should not have gone down. I theorized that this could be because China evades oil sanctions and therefore underreports the amount of oil it imports, and I wondered whether there would be a similar pattern in other cases of sanctions evasion.

This question excited me for several reasons. As a political science major minoring in computer science, I am interested in how publicly available open-source data can be used to produce useful insights about real-world phenomena. I was particularly intrigued by the concept of using publicly available trade data to indicate illicit trade because, after taking a class on terrorism with Dr. Jonathan Cristol, I became fascinated by terrorist financing, which often utilizes mechanisms and channels similar to those used in illicit trade.

There are several potentially important outcomes and real-world implications of this research into the effect of new sanctions on trade. It is a potentially valuable insight to determine if there is a correlation between sanctions on oil-producing countries and drops in trading partners' imports. Such a connection, if proven, could be an incredibly useful mechanism for detecting countries engaging in the illicit oil trade. This could potentially help detect sanctions evasion because a drop might indicate that the country was underreporting its oil imports and could become a widely accepted metric to look at when analyzing import and export records. Alternatively, if there is no correlation between oil imports decreasing and sanctions evasion, it is helpful to rule that out as a hypothesis so that research checking for a correlation will not be unnecessarily reproduced and can instead be focused on other promising predictors. Lastly, if there was not enough usable data to reach a conclusion, it would be helpful to record what gaps

exist in open-source data to help future researchers and those who have the power to make such data available understand its importance to the research community.

Methodology/Parameters

This paper's original hypothesis is that a reduction in country X's aggregate oil imports in the year after sanctions were implemented on a major oil-producing country could indicate that country X is engaged in sanctions evasion, and thus is underreporting its oil imports. To test this hypothesis I set out to record as many known cases of sanctions evasion as I could find in order to build an index of frequent evaders. I then planned to analyze the import data of these potential sanctions-evading countries to see whether aggregate oil imports dropped in the year following the imposition of sanctions. To explore this question, I decided on several parameters. First, I determined that there were only four countries that were both significant oil exporters and that were sanctioned by the United States: Iran; Russia; Syria; and Venezuela. I then elected to exclude Syria because, due to the Syrian civil war, Syria has not been a significant producer of oil in over ten years. I thus focus on countries that evaded U.S. sanctions by importing oil from Iran, Russia, and Venezuela.

I also decided to focus specifically on sanctions enacted from January 1991 to April 2023. I chose to start in 1991 because sanctions on Iran started in 1979, but I felt that the world order was too different before the collapse of the Soviet Union in 1991, and wanted to compare my data under a similar world order in a consistent global environment. I ended in April 2023 as the latest date for which reliable data was available.

Furthermore, I chose to examine only sanctions by the U.S. for two reasons. Firstly, limiting the research to American sanctions ensured consistency in the types of sanctions and in the reasons for which they were imposed. This is because the effect of the sanctions is potentially dependent on the cause of the sanctions and who imposed them, because a sanctioned country may have a different relationship with different entities that enact sanctions and thus behave differently and feel varying degrees of being compelled to comply with the sanctions or not. More importantly, because international trade in oil is conducted in U.S. dollars, and bank transfers are made using the U.S.-based SWIFT network, American sanctions on oil exports are far more wide-reaching than they might seem and essentially prevent anyone who trades with the sanctioned country from participating in the legal international oil trade. Therefore, U.S. sanctions on oil exporters are, effectively, international sanctions.

This paper also looks only at sanctions violations by state or parastatal actors, not independent companies or other third parties. This paper also assumes that sanctions violations of any significant quantity are conducted with at the least the tacit acquiescence of the state and thus I make no distinction between state and non-state importers or exporters. This distinction is because it is unlikely that oil tankers could offload their cargo without detection. Moreover, it is logical to assume that illicit importers are often operating with the tacit approval of the state, due to the state believing the smuggled oil is necessary for the state's economy.

Additionally, I use the word "oil" as a catch–all phrase for oil, gas, natural gas, crude, petroleum, petrochemicals, and any other oil or petroleum-derived product produced by the aforementioned sanctioned countries.

To test my hypothesis, I use a wide range of open-source data, including official sources and raw data; academic research; maritime traffic tracking websites; and mainstream media.

Below I discuss each of the three countries under review at length to provide the current and historical context in which their oil sectors operate and in which sanctions were imposed. This context will allow for a more thorough analysis of the possible interpretations and correlations of the oil import data I study. I begin each case study by providing background about the development of the country's oil sector, then give an overview of the U.S.-imposed sanctions. I then explain what tactics the country uses to continue to export its oil and to evade sanctions, including the main companies, shipping groups, and individuals who are involved in illicit trade. After analyzing the three countries in this manner, I will discuss various cases of sanctions evasion and the main countries that import illicit oil. I will end by looking at those illicit importer countries' oil import data to see if my hypothesis is correct.

Venezuela

Oil was discovered in Venezuela in the 1920s, and the country has become progressively more and more dependent on oil. Venezuela is considered to be a petrostate, which means that its economy is highly reliant on oil production. This made Venezuela susceptible to developing the "resource curse," and sure enough, Venezuela became a victim of the "resource curse" in the 1980s. Also known as Dutch disease, the resource curse denotes the negative effects that can often occur when a state has an abundance of natural resources. Flooded with oil wealth, these countries experience an influx of outside capital and continue to invest in the oil industry, causing the economy to become highly dependent on oil production and drying up other markets, causing a heavy reliance on external imports and sucking wealth away from other sectors. This

unhealthy dependence on oil often causes high unemployment rates and a vulnerability to fluctuations in global oil prices.[2]

Since the 1980s, Venezuela has experienced a severe economic decline. The authoritarian regimes of Hugo Chavez and later Nicolas Maduro only exacerbated many economic and political issues with which Venezuela was already grappling. Furthermore, Venezuela's oil industry has been under national control since 1976, when state-owned oil company Petróleos de Venezuela (PDVSA) was founded, and government dysfunction lead to further mismanagement of the industry.[3] Today, between embezzlement of the country's oil wealth and economic sanctions imposed by the U.S. in an attempt to encourage better behavior from the regime, Venezuela faces a near-total economic collapse.[4] Venezuela has been the target of at least limited U.S. sanctions since 2006. These sanctions were imposed for various reasons including a lack of cooperation with anti-drug and counterterrorism efforts; human rights abuses; and anti-democratic actions. Under the Obama administration, the U.S. broadened this effort by specifically sanctioning certain members of Venezuela's government individually. However, it was only in 2017 that sweeping economic sanctions were enacted by the Trump Administration in response to the rise in authoritarianism under Maduro. From 2017-2019, multiple rounds of sanctions focused on crippling Venezuela's economic sector to put pressure on the Maduro regime to stop their malign activity and to halt their human rights abuses.[5]

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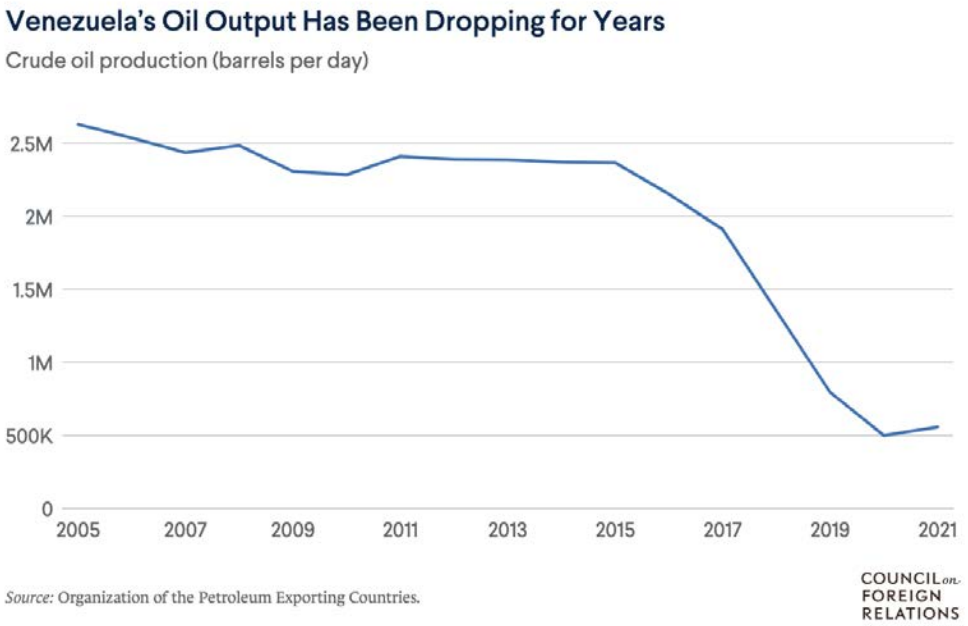
[2] Tavenier, R. (2017). The Venezuela Crisis and The Dutch Disease. Jason Institute for Peace and Security Studies. (9 September 2017).

[3] Britannica, The Editors of the Encyclopedia. (2023). Petróleos de Venezuela, SA. *Encyclopedia Britannica*. (21 March 2023).
[4] Cheatham, A. et. al. (2023). Venezuela: The Rise and Fall of a Petrostate. *CFR Backgrounder*. Council on Foreign Relations. (10 March 2023).
[5] Seelke, C.R. (2022).Venezuela: Overview of U.S. Sanctions. *CRS In Focus*. Congressional Research Service. (30 November 2022).

Although the first sanctions that the U.S. put on Venezuela were in 2006, the first sanctions that targeted the financial sector (and therefore by default, the oil sector) were put into place on 24 August 2017 by the Trump Administration in response to the government's anti-democratic behaviors and human rights violations.[6] These sanctions blocked the Venezuelan government and the PdVSA from accessing U.S. financial markets. The next round of sanctions was put into place in March, May, and November 2018.[7] These sanctions expanded on the earlier 2017 sanctions and prohibited transactions using coins or digital currency issued by the government, prohibited transactions involving Venezuelan debt, and implemented a framework to block transactions of any individuals or companies acting within sectors of the economy and corrupt transactions with Maduro's government. In January and August 2019, the U.S. expanded on the previous sanctions and designated the PdVSA, as the facilitators of one of the main sources of revenue for the Maduro regime, as subject to U.S. sanctions.[8] The sanctions have been successful in pressuring Venezuela's economy, and the country's oil exports have steadily dropped since sanctions were applied.[9] This decline is exhibited in the chart below, which shows Venezuelan oil production levels from 2005-2021.[10]

[6] See Executive Order 13808.
[7] See Executive Orders 13827, 13835, and 13850.
[8] See Executive Orders 13857 (January) and 13884 (August).
[9] Cheatham, A. et. al. (2023).
[10] Ibid.



However, despite the sanctions, Venezuela continued to export oil to illegal buyers through several channels. To solve the problems of illicit exporting, Venezuela took advantage of other sanctioned countries' experiences, particularly in duplicating a number of methods first popularized by Iran. For example, specific oil tankers are often targeted with sanctions, making it difficult for them to dock in ports without being tracked. To get around these restrictions, ships were given false documents and renamed, often after every voyage, making it extremely difficult to track an individual ship's activity.[11] Additionally, sanctions-evading ships often turn off their transponders mid-voyage so that they can't be tracked via satellite. The ships are therefore identifiable only at the beginning and end of their voyages when the transponder is still on. These oil shipping journeys are often termed "dark voyages," because ships go "dark" and off the grid for weeks at a time until they reach their destination.

[11] Vargas, S. (2020). Staying Afloat: Shipping Networks in the Wake of U.S. Sanctions on Venezuela. Center for Advanced Defense Studies (C4ADS). (13 July 2020).

Another tactic that is used to smuggle oil is to relabel the oil with a false origin. Because some Venezuelan crude is of similar makeup to Malaysian crude, it is frequently relabeled as Malaysian on quality certificates, which are certificates obtained from a laboratory after they test the oil to reassure the buyer that the cargo is within the contract's specifications. Often the company testing and labeling the cargo has no idea that it is mislabeling the oil. In one specific case, a ship of Venezuelan oil obtained a quality certificate from a laboratory in Singapore, which measured various characteristics of the oil and incorrectly identified it as Malaysian heavy crude based on its similar chemical composition. The laboratory's owner told Reuters that the oil had been certified as Malaysian based on an analysis of the product and documentation provided by their client.[12]

Another tactic used is ship-to-ship (STS) transfers. An STS transfer is when products are transferred directly from one ship to another at sea. Legal STS transfers are required to follow a standard set of protocols that include notifying the Coast Guard, which sanctions-evading ships are obviously unable to do. [13] STS transfers are a common tool often used legally by regular cargo ships to avoid port fees or when ships are too big for ports.[14] However, STS transfers that are carried out by sanctions-evading ships are used for different reasons. The first is that it allows illicit ships to avoid both the risk of being detected while at port and the temporal and financial cost of obtaining false documents. Additionally, if done correctly, the transfer lends additional veracity to a false claim of the oil's origin by performing the switch near the false country of origin and turning the ship's transponder back on once the transfer is complete so that to all appearances a ship departed the false country of origin carrying a cargo of oil from that country.

[12] Paige, M. and Saul, J. (2022). Venezuelan Oil Exports Flow Using False Documents, Ships Linked to Iran. *Reuters*. (30 November 2022).
[13] Hellenic Shipping News. (2021). Shipping Industry Seeks to Combat Dark Oil Transfers at Sea. *Dryad Global*. Online. (22 July 2021).
[14] Wankhede, A. (2021). What is Ship-to-Ship Transfer (STS) and Requirements to Carry Out the Same?. *Marine Insight.* Online. (6 May 2021).

Venezuelan oil is primarily exported through the Russian oil company Rosneft and its subsidiaries and through assorted Venezuelan and Mexican firms and individuals. Rosneft is a Russian state-controlled international energy company.[15] As sanctions become increasingly expansive, the Russian company has been one of the few willing to risk trading Venezuela's economically "toxic" crude. Rosneft began shipping Venezuelan oil in 2016 and paid Maduro $1.5 billion in 2016 and $1.6 billion in 2017, just a few days after the more expansive 2017 sanctions were enacted. Rosneft has continued to invest in the trade relationship even as sanctions have escalated.[16] Since 2019, Rosneft has been one of the biggest exporters of Venezuelan oil, and its share has only continued to grow. It bought 66% of Venezuelan crude in August 2016 and resold it to buyers in China and India, doubling the pre-sanction sales levels. Rosneft is now in control of shipping and selling most of Venezuela's oil exports, ensuring that they get to buyers around the world. In 2020, Rosneft handled an estimated 70-80% of Venezuela's oil exports- 66-76% of all Venezuelan export revenue.[17]

This dependence on Rosneft has its drawbacks. The Russian shipping company ensures that Venezuelan oil reaches the global market, but Venezuela's profits are limited by Russia's insistence on a significantly below-market price. Russia has had close ties with Venezuela since 1999, taking the country under its wing after socialist leader Chavez came to power. However, this relationship has not stopped Russia from taking advantage of Venezuela's desperation to make as much money as possible. It does this not by demanding direct fees, but by demanding

[15] N.A. (2020). Treasury Targets Russian Oil Brokerage Firm for Supporting Illegitimate Maduro Regime. United States Department of the Treasury. (18 February 2020).
[16] Mazneva, E. and Bierman, S. (2017). Russian Oil Giant Lends Support to Venezuela Oil Company. *Bloomberg*. (4 August 2017).
[17] Faiola, A. and DeYoung, K. (2020). In the U.S. embargo on Venezuelan oil, Russia is a clear winner. *The Washington Post*. (6 February 2020).

ridiculously low prices that it can resell with a high-profit margin, an enterprise that is bringing them an estimated $120 million a month in sales.[18]

Additional key players in Venezuelan oil exports are several Mexican companies, including Libre Abordo and Schlager. These companies have been a key lifeline for Maduro's regime, as they conduct most of their business by doing oil-for-food swaps at a time when the regime is struggling to afford basic imports. Over four months in 2020, Libre Abordo and Schlager increased their acquisition of PDVSA's oil from under 3% to 39% of the Venezuelan company's total exports.[19]

The main importers of Venezuelan oil are China, India, and Cuba, with Indonesia following close behind. China has been the country's largest importer after the U.S., formerly the largest importer, stopped buying Venezuelan oil after 2018. Although China does not always buy directly from Venezuela, it still imports a huge percentage of Venezuelan oil through Rosneft or other intermediaries.[20] India also imports oil from Venezuela through Rosneft and often does business through trade, not U.S. dollars, to avoid directly violating sanctions.[21] With an ever-growing demand for oil, India is desperate to get it from wherever it can find it. [22] Cuba, on the other hand, has always imported directly from Venezuela, with Venezuela providing about 75% of their oil imports at one time. However, since 2020, as Venezuelan oil production has fallen, Cuba has struggled to keep up with the demand for oil, and today Venezuela only supplies

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[18] Ibid.

[19] There is an inconsistency between this percentage and an earlier claim that Rosneft handles 70%-80% of Venezuela's exports because the numbers come from two different sources. This inconsistency is possibly due to: 1) The two numbers being estimates; and 2) the articles being from different years, so it is possible that the percentages fluctuate. (Parraga, M. et. al. (2020). Exclusive: FBI probes Mexican, European firms over Venezuela oil trading - sources. *Reuters*. (13 May 2020).)

[20] Aizhu, C. (2019). China CNPC skips Venezuelan oil loading for second month: sources. *Reuters*. (10 September 2019).

[21] Verma, N. and Parraga, M. (2019). Exclusive: India's Nayara supplying fuel to Rosneft in exchange for Venezuelan oil - sources. *Reuters.* (15 October 2019).

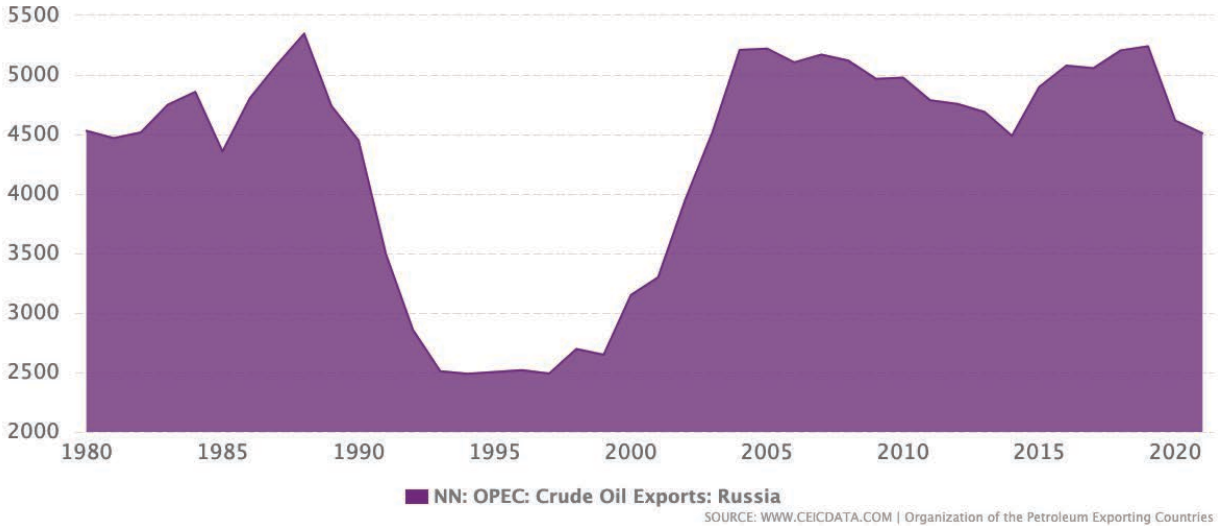
[22] Dutta, R. and Mohanty, S. (2022). India hopes early return of Iranian, Venezuelan crude to soften price blow. S&P Global Commodity Insights. (1 April 2022).

around half of the country's oil. [23] The last major importer of Venezuelan oil is Indonesia, based on evidence from a variety of sources in 2021 that state-owned Indonesian oil company Pertamina has been receiving imports of Venezuelan oil.[24] In spite of these oil importers, Venezuela is still struggling to stay afloat with nominal income.

Russia

Oil was discovered in Russia in the mid-19th century. The oil sector experienced a surge in growth and development in the second half of the 20th century when the Soviet Union began investing heavily in the expansion of its oil production capabilities. By the 1980s, it was the largest oil producer in the world. However, as a result of this investment, the Soviet (and later the Russian) economy became oil-dependent.[25] This dependency was demonstrated when a dramatic decline in oil production after the 1991 Soviet collapse drastically worsened the state of an already spiraling economy. This decline proved temporary, however, and from 1994 until Russia's initial invasion of Ukraine in 2014 Russia was able to restore its oil production to Soviet-era levels.[26] This is exhibited in the chart below, which shows the fluctuation in Russian oil export levels from 1980-2020.[27] Note the decline during the immediate post-Soviet years and the slow but steady rise to Soviet levels.

[23] Parraga, M. (2022). Cuba struggles to buy fuel as imports from Venezuela dwindle -data. *Reuters*. (5 April 2022).
[24] Rapoza, K. (2022). How Venezuela's Socialists United Is Finding Ways Around Oil Sanctions. *Forbes*. (23 January 2022).
[25] Ermolaev, S. (2017). The Formation and Evolution of the Soviet Union's Oil and Gas Dependence. Working Paper. Carnegie Endowment for International Peace. (29 March 2017).
[26] Kornfeind, H. (2020). Russia's Complex Oil Reality. *Energy Realpolitik*. Council on Foreign Relations. (27 May 2020).
[27] N.A. (n.d.). Russia Crude Oil: Exports. CEIC Data.



The 2014 invasion resulted in the imposition of sanctions on Russia by most Western countries, mainly targeting the financial and energy sectors. This has hindered investment and development in the Russian energy sector. The post-invasion sanctions essentially restrict Russian firms' access to international markets.[28] The combination of sanctions and a global drop in oil prices tanked the value of the ruble and caused high levels of inflation inside Russia.[29] However, despite multiple rounds of sanctions and their impact on the economy, Russia continues to illicitly sell oil.

The first round of sanctions in March and December of 2014 targeted the government, individuals, and companies that undermined democracy, were key operators in the economic sector, or were related to the Crimea invasion.[30] Another round of sanctions was implemented in 2018 in response to Russia's continued aggressive actions and targeted various key individuals in

[28] N.A. (2015). IMF Survey : Cheaper Oil And Sanctions Weigh On Russia's Growth Outlook. *IMF Country Focus*. International Monetary Fund. (3 August 2015).
[29] Christie, E.H. (2015). Sanctions after Crimea: Have they Worked?. *NATO Review*. North Atlantic Treaty Organization. (13 July 2015).
[30] Sanctions were enacted through Executive Orders 13660, 13661, and 13662, in March 2014, and Executive Order 13685 in December 2014.

the finance and defense sectors.[31] Then, in August 2019 additional financial sanctions were imposed.[32] The most recent round of sanctions was implemented in February 2022 in response to Russia's invasion of Ukraine.[33]

The measurement of Russian oil sanctions evasion is different from that of Venezuela and Iran for several reasons discussed below. Perhaps the most important difference is that, unlike in Iran and Venezuela, about half of Russian oil is exported by pipeline rather than by ship.[34] This is due to some of the geographic challenges Russia faces because of its vast geographic sprawl and because many of its most productive oil fields are landlocked, which has led it to develop the second-largest network of gas pipelines in the world.[35] However, since its 2022 invasion of Ukraine, Russia has had to rely more heavily on exporting via ships and has attempted to build a "shadow fleet" of oil tankers.[36] In the immediate aftermath of the invasion, Russian oil exports appeared to be at close to normal levels, but tankers often left port without a final buyer lined up. The oil exports would either find a final buyer once they had left port or would go directly to storage facilities in the Netherlands or elsewhere. Transferring oil to storage facilities outside of Russia is allowed under current sanctions, and it is a successful sanctions evasion tactic because the product can later be sold illicitly when it is almost impossible to track.[37]

It is possible to identify sanctions imposed on Russia before February 2022, but because these sanctions did not include a blanket ban on Russian oil it is hard to quantify the extent of sanctions evasion. After February 2022, the sanctions regime was more akin to those imposed

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[31] See E.O. 13849.
[32] See E.O. 13883.
[33] See E.O. 14065.
[34] Zu, C. (2022). Russia crude oil pipeline capabilities to mainland China—The ESPO crude oil pipeline. S&P Global Commodity Insights. (1 April 2022).
[35] Hussein, M. (2021). Mapping the world's oil and gas pipelines. *Al Jazeera*. Online. (16 December 2021).
[36] Northam, J. (2023). Russia has amassed a shadow fleet to ship its oil around sanctions. *National Public Radio*. Online. (21 January 2023).
[37] Von Schaik, J. and Mathonniere, J. (2022). Russian Oil Trade Goes Dark, But Exports Continue. Energy Intelligence Group. (16 March 2022).

on Iran and Venezuela, and thus easier to both measure evasion and draw comparisons between the three cases. Prior to the 2022 invasion, the West was hesitant to ban Russian oil for several reasons. First, an economy as large and intertwined with the world as Russia had never been so severely sanctioned before. Second, Russia's share of global oil production was second only to the United States (and was tied with Saudi Arabia), and there was concern that a ban on Russian oil would *benefit* Russia by driving the price up.[38]

Instead, the U.S. introduced a complex set of rules targeted at impairing specific aspects of the Russian economy, including exports and development, to try to put economic pressure on Moscow. These measures included sanctioning various types of ongoing oil technology projects, which affect Russian capabilities, and imposing a price cap on Russian oil. The idea was to limit revenues to Russia while maintaining the global oil supply. However, it seemed that these sanctions were not working even before the 2022 sanctions because in 2021 Russia was predicted to maintain constant pre-sanctions oil production levels despite the price cap and seemed to be maintaining consistent revenues.[39] However, more recent data suggests that sanctions may finally be working and that oil export revenues are declining.[40]

In May 2020, around 75% of Russian oil was exported to Europe and Northeast Asia, most of it via pipelines. As a result of Covid-19, demand for oil decreased in Europe. However, Covid-19 allowed Russia to gain market share in China, surpassing imports from Saudi Arabia, Iran, and Venezuela.[41] This development was eventually essential in allowing Russia to continue to transition away from European markets after the 2022 sanctions.

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[38] Aleksashenko, S. (2016). Evaluating Western Sanctions on Russia. Dina Patriciu Eurasia Center and Global Business & Economics Program. Atlantic Council. (December 2016).
[39] Ibid.
[40] Mitrova, T. (2022). Q&A | Understanding the Impact of Sanctions on the Russian Oil and Gas Sector with Limited Data. Center on Global Energy Policy. Columbia University School of International and Public Affairs. (29 September 2022).
[41] Kornfeind, H. (2020).

After February 2022, Russia's market for oil exports shifted dramatically. The West has attempted to greatly reduce its imports of Russian oil. EU countries, including Poland and Germany, pledged to reduce their imports by 90% percent by 2023.[42] The U.S. and G7 have also lowered the price caps on Russian oil to $60 per barrel.[43] This reduction has led to a pivot towards other markets and towards other sanctions-evading states. Eager to snap up any available oil, countries like India and China have greatly increased their imports of Russian oil.[44] India, once an insignificant buyer for Russia, is now Russia's second-largest export destination.[45]

Even though in some ways post-2022 sanctions violations should be easier to monitor and detect because the rules became stricter and therefore more clear-cut, in many other ways violations are much more difficult to track. This difficulty is because many developing countries that publicly support the sanctions on Russian oil also violate the sanctions because they cannot keep up with demand otherwise and would be crippled by supply shortages if they complied with the sanctions. In some cases, such as India, the U.S tacitly allows the purchase of Russian oil, despite controversy and disapproval domestically.[46]

However, oil is not only being snapped up by East Asian and Middle Eastern countries because they need the oil domestically; they also buy it for resale. In a report from the Centre of Research on Energy and Clean Air, an analysis of oil imports and exports from the past year indicates that some countries may be consuming more cheap Russian oil than ever before for a different reason. These sanctions-evading countries, including China, India, Turkey, the United Arab Emirates, and Singapore, can refine the Russian oil and resell it to Western countries who

[42] Perkins, R., et al. (2022). Eu Agrees Compromise Deal to Ban 90% of Russian Oil Imports by Year End. S&P Global Commodity Insights. (31 May 2022).
[43] Rosenberg, E. and Van Nostrand, E. (2023). The Price Cap on Russian Oil: A Progress Report. U.S. Department of the Treasury. (18 May 2023).
[44] Gugarats, H. (2022). US extends sanctions waiver for Russian energy. *Argus Blog*. Argus. (14 June 2022).
[45] Lee, J. (2022). Russia's Crude Flows to Asia Take Hold Near Unprecedented Levels. *Bloomberg*. (13 June 2022).
[46] Menon, S. (2022). Ukraine crisis: Who is buying Russian oil and gas?. *BBC News*. Online. (6 December 2022).

may have vowed not to buy Russian oil, but face shortages if they can't find alternative exporters. These countries are termed "laundromat countries," because they refine Russian oil and "launder" it to sell to Western countries.[47]

This most recent round of sanctions evasion has provided evidence that Russia may be developing its evasion network enough that it will soon get to the point where it can sell enough oil outside of the price cap. Between its expanding "shadow fleet," and shifts in its export network to non-Western markets, Russia's vulnerability to sanctions may significantly decrease, potentially limiting the U.S.'s economic leverage.[48]

Iran

Although oil was discovered in Iran in the early 1900s, the energy sector in Iran today traces its roots back to the early 1970s when Shah Mohammad Reza Pahlavi began heavily investing in oil production. However, in 1979, the Shah was overthrown in the Iranian Revolution, and in the chaos that followed, oil production was halted. The new regime eventually invested in energy production and formed the state-run National Iranian Oil Company (NIOC), but never returned to pre-revolutionary oil production levels. Today, although Iran opened the industry to semi-privatization, all oil-production firms are state-run or parastatal.[49]

The U.S. first levied sanctions on Iran in response to the 1979-1981 hostage crisis. Throughout the 1980s and 1990s, additional rounds of sanctions were enacted in an attempt to limit Iran's growing power in the region and to compel the country to end its support for terrorist

[47] Thieriot, H. et. al. (2023). The Laundromat: How the price cap coalition whitewashes Russian oil in third countries. Centre for Research on Energy and Clean Air. (19 April 2023).
[48] Swanson, A. (2023). Russia Sidesteps Western Punishments, With Help From Friends. *The New York Times*. (31 January 2023).
[49] Maloney, S. (2015). *Iran's Political Economy Since the Revolution*. Cambridge University Press.

groups. Later, sanctions were imposed to prevent the growth of Iran's ballistic missile program and to hinder and punish its trade in small arms, support for terrorism, and developing nuclear program.

Despite the myriad rounds of sanctions, this paper focuses only on sanctions that pertain to the financial and energy sectors. The first relevant Iranian sanctions of this category were Executive Order (E.O.) 12957 of 15 March 1995, and E.O. 12959 signed on 7 May 1995.[50] These executive orders banned investment in and trade with Iran focused on the energy sector. This was extended with E.O. 13059 on 19 August 1997, which prohibited U.S. companies from knowingly exporting goods to countries to incorporate into goods that were going to go to Iran. Sanctions pertaining to the nuclear program were briefly lifted from 2015 through 2016, after Iran entered the Joint Comprehensive Plan of Action (JCPOA,) and were then reimposed by E.O. 13846 on 6 August 2018 after the Trump Administration's withdrawal from the JCPOA. This executive order imposed the most stringent sanctions on Iran's energy sector in recent years and aimed to cripple the industry by restricting Iran's energy, shipping, and shipbuilding sectors.

Historically, Iran has openly flouted Western sanctions and continues to use its fleet of more than 54 tankers to export its oil all over the world.[51] In a 2018 interview with the *New Yorker*'s Robin Wright, then-Iranian Foreign Minister Javad Zarif said, "If there is an art we have perfected in Iran, and we can teach it to others for a price, it is the art of evading sanctions."[52] This perfectly encapsulates Iran's abilities as the most successful sanctions evader in the world.

It is important to note that while some Iranian oil ships and people involved in shipping Iranian oil have been sanctioned, unlike the sanctions imposed on North Korea, the U.S.

[50] Clinton, W.J. (1995). Prohibiting Certain Transactions With Respect to the Development of Iranian Petroleum Resources. Executive Order 12957. Executive Office of the President. *Federal Register*. 60(52). (17 March 1995).
[51] Bockmann, M.W. (2019). Iran oil exports on the rise as national tanker fleet reflags. Lloyd's List. (21 March 2019).
[52] Wright, R. and Zarif, M.J. (2018). Plenary Session - Newsmaker Interview: Mohammad Javad Zarif. *Doha Forum*. YouTube. (15 December 2018 (posted 15 April 2019)).13:14.

sanctions regime on Iran does not require any country or person to "actually seize, intercept, inspect on the high seas, or impound any Iranian ship suspected of carrying oil or other cargo that is subject to sanctions." This is an important distinction as to what qualifies as a case of sanctions evasion.[53]

Ships that export oil from Iran use sanctions-evasion tactics such as ship-to-ship transfers, renaming vessels, and turning off their tracking systems. These tactics may seem similar to those used by Venezuela because Iran taught these tactics to Venezuela. However, according to a 2019 report by the Center for Advanced Defense Studies (C4ADS), Iran uses many other methods as well. The C4ADS team tracked a few specific suspicious ships using a combination of automatic identification system (AIS) logs and satellite imagery, when there seemed to be [intentional] gaps in the information, to track voyages.[54]

C4ADS found that to export oil from Iranian ports, ships need to obfuscate or conceal their docking in Iran so that there are no records of them entering Iranian ports, allowing them to evade trade restrictions and continue to transport illicit cargo. All ships entering loading ports are mandated to have their AIS transmitters on and to be transmitting their tracking system information at all times. The C4ADS data indicates that these vessels may not be turning on their AIS transmitters when entering Iranian loading ports, because there is no record of the ships on transmitter logs, but there *is* satellite imagery of them making port.[55]

Ships transporting illicit oil also report false destinations to prevent themselves from being tracked. Although the ships actually do visit the "decoy" destination, it is not the true destination where the ship will pick up or drop off oil exports. After remaining off the grid for

[53] Katzman, K. (2022). Iran Sanctions. *CRS Report*. Congressional Research Service. (2 February 2022).
[54] Similar to transponders, automatic identification systems (AIS) are mandatory for all ships and transmit their data to other ships and vessel traffic services.
[55] Accardi, E. (2020). A Hull in Their Story: Satellite Imagery, AIS, and the Ships Secretly Transporting Iranian Gas to China. Center for Advanced Defense Studies (C4ADS). (23 April 2020).

enough time to load Iranian oil at the unreported location and get to the decoy destination, the ships turn their AIS transmitters back on so that it seems that the fake destination is their real starting point. At this point, the ships often change their name, and their flag, and sometimes even change the ship's owners to further obscure their illicit activity and label the illicit oil as originating in that place.[56] Oil is relabeled as oil from UAE, Malaysia, and Oman, or just "Middle Eastern" oil.[57]

The largest importer of Iranian oil today is, unsurprisingly, China. The two signed a 25-year trade agreement in March 2021 that aims to increase oil trade and promote Chinese investment in Iran's energy sector.[58] However, the strong ties between the two countries are far from new. Iran began pursuing an energy relationship with China in the early 1990s. Although Iran had initially been pursuing more traditional customers from European countries, it soon realized that it was advantageous to invest in an Iran-Sino relationship, as China is a strong partner in combating Western pressure on Iran.[59] China was willing to strengthen economic ties, regardless of the West's disapproval.

The economic relationship between China and Iran dramatically grew in 2004, when the two countries signed a series of large trade deals. As increasingly intense sanctions caused many foreign investors and developers to leave, China took advantage of its access to the large Iranian market. From 2010 to 2015, most countries were unable to invest in Iranian oil development projects and imports due to sanctions, which allowed the Sino-Iranian trade to grow even further. Although China has faced opposition and backlash from the U.S. and has proceeded cautiously, there has been slow but steady progress.

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[56] Ibid.
[57] Sudetic, B. and Shokri, U. (2021). Iranian sanctions evasion and the Gulf's complex oil trade. Middle East Institute. (11 May 2021).
[58] Eqbali, A. (2021). Iran seeks to boost oil exports to China with bilateral agreement. S&P Global Commodity Insights. (27 March 2021).
[59] Maloney, S. (2015).

Until 2019, shortly after the U.S. doubled down on Iranian sanctions, another major importer of illicit Iranian oil was India.[60] India is a rapidly developing country and is the world's third-largest consumer of energy.[61] To keep up with domestic demand, it needs to purchase oil at low prices, even with the potential cost of violating sanctions. From 2006 to 2019, Indian imports of Iranian oil rapidly grew. In 2005, India was not even on Iran's list of top 20 export markets, and by 2006 it was the third largest on the list. [62] In 2018, when the Trump Administration renewed sanctions, India was granted a one-year waiver to import Iranian oil. However, India had to terminate imports after the waiver was not renewed in 2019, as it was too costly to evade sanctions.

Although when speaking publicly, Iranian government officials confidently deny the effects of U.S. sanctions, years of economic pressure have taken its toll. U.S. sanctions have forced Iran to form relationships with other sanctioned countries like Russia and Venezuela, as well as willing sanctions evaders like China, North Korea, Syria, and Belarus. Together, these states have attempted to form their own informal trading network separate from the SWIFT financial trading system and other Western trading institutions. However, Benjamin Tsai, a senior associate with the risk intelligence firm TD International, points out that, "These sanctions-circumvention measures…may ensure regime survival, but will not lead to economic growth. It is inconceivable that this 'bloc' of sanctioned nations will rival the West economically in any way."[63]

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[60] N.A. (2019). Iran to sell oil in 'grey market' as US tightens sanctions. *Al Jazeera*. Online. (5 May 2019).
[61] Meena, R.K. (2022). India has been ranked third largest primary energy consumer in the world. Press Release 1809204. Public Information Bureau India. (24 March 2022).
[62] Caves, III, J.P. (2023). Oil Trade Between Iran and India Plummets. *The Iran Primer*. United States Institute of Peace. (12 June 2019).
[63] Scollon, M. (2023). 'A Terrible Club To Be In': Russia, Iran, And The Bloc Of Sanctioned Nations. *Radio Free Europe/Radio Liberty*. Online. (3 January 2023).

Conclusion

This project was an attempt to determine whether a decrease in a country's reported oil imports in the year after sanctions were implemented on an oil-producing country could indicate that the importing country was evading sanctions and underreporting its oil import amounts. However, in the course of my research, I encountered several obstacles that prevented me from conducting direct tests of my original hypothesis.

First, most cases of countries evading the sanctions on Venezuela, Russia, and Iran have a lot of overlap, meaning that sanctions-evading countries generally import oil from multiple sanctioned countries. The two most significant countries that import illicit oil from all three of these sanctioned countries are China and India. This importing overlap makes it difficult to correlate specific rounds of sanctions with fluctuations in export levels because there are sanctions and reports of China and India importing illicit oil almost every year in varying combinations of sources and percentages. Therefore, there is no "year zero" or base import amount to serve as a baseline for comparison.

Another major issue that I encountered was a lack of easily accessible, publicly available, consolidated data. The data "landscape" for this subject matter consists of a patchwork of information from a variety of data sources. Think tanks like C4ADS have conducted in-depth case studies where they may follow a few tankers at a time and piece together information about sanctions-evasion tactics.[64] News sites sometimes report individual cases of sanctions evasion, or will sometimes do a more in-depth feature on oil smuggling.[65] Government websites post information about the sanctions that are imposed on companies, countries, ships, and

[64] Accardi, E. (2020).
[65] Parraga, M. et. al. (2020).

individuals.[66] Some think tanks or government agencies publish reports about isolated incidents or cases of oil sanctions evasion.[67] However, all of these sources of information are only focused on small pieces of the larger puzzle which is the global oil-smuggling architecture.

Although there are websites and databases that appear to collect some of the data necessary to test my hypothesis, the data is only available for steep premiums because such difficult-to-collate and economically relevant datasets are generally marketed for corporate use. Beyond that, many of these companies offering data for sale have limited historic data. For example, TankerTrackers.com uses satellite imagery to monitor and track various tankers and has only been doing so since 2018; another company, Kpler, tracks trade information, but only since 2014. In a time where research is severely underfunded but more important than ever, it is imperative that there are comparable open-source databases that researchers can use.

Another issue was that even when there were accessible databases that had relevant information to this project, there was often little transparency in regard to the data's provenance. Factors such as how the data was obtained, what choices were made about what data to include and what to exclude, and other details about the dataset are all important to the interpretation and analysis of the data. For example, the Observatory of Economic Complexity has records of Iranian oil export destinations organized by country and USD value; but it does not provide information on the source of this information and what was included/excluded, which rendered the site useless for the purpose of this paper. The lack of clear documentation about databases can really obstruct a researcher from effectively understanding and interpreting data.

[66] N.A. (2021). Treasury Targets Venezuelan Oil Sector Sanctions Evasion Network. *Press Releases*. United States Department of the Treasury. (19 January 2021).
[67] Oliveros, L. (2020). The Impact of Financial and Oil Sanctions on the Venezuelan Economy. Washington Office on Latin America. (October 2020).

Because of these issues, I was unable to directly test my hypothesis. Such a test would only be possible if there was a consolidated dataset available that included a list of cases of sanctions evasion including the sanctions that were violated, the country and company that conducted the sanctions evasion, the country that the oil was exported from, and imported to, and the date or date range that it occurred. Additionally, even if there is a case that seems like it may be sanctions evasion, it is possible that the state or company has a waiver and is legitimately allowed to import or export the oil from the sanctioned state. However, tracking down waivers was very difficult to do. A database of sanctions waivers given would also be very useful for research purposes.

If there were such databases it might be possible to look at each recorded case of sanctions evasion and look for correlations between the imposition of sanctions on country X and the reported aggregate oil imports of all other countries. If there were enough cases to be statistically significant, it would be possible to conclude that changes in reported oil imports can actually be an important indication of sanctions evasion. If the data has no statistically significant correlation, that also would be valuable as it could eliminate changes in aggregate oil imports as a possible indicator of sanctions evasion.

My research question is still important to the field. One important tool to uncover oil sanctions evasion is by analyzing trade data to discover discrepancies. By determining whether a decrease in exports is a potential indicator of oil sanctions evasion, a researcher could either rule out a potential method or add it to the roster of methods to uncover evasion. However, although my specific question is important, the problems I encountered in my exploration of this topic are arguably a more important discovery, because they are issues endemic to all research on this subject. My research has shown that the inability to publicly access sufficient organized data

about cases of sanctions evasion makes it impossible for a researcher to definitively test the hypothesis that oil import data can indicate sanctions evasion or any other similar hypothesis.

Policy experts and news outlets often quote information about sanctions evasion and it is often unclear where their information is derived from, and there is a lack of publicly available data otherwise. This phenomenon leads me to ask: how do we actually know anything about sanctions evasion? Some relevant information could be classified, but there is no reason to believe that all such information would be classified. Current methods to track illicit oil shipments include shipping and maritime surveillance; whistleblower reports; financial analysis or trade and customs analysis; and open-source intelligence. But none of this data is collated in any useful way in any sort of database, and anyone making statements about oil sanctions evasion is likely doing so by mostly reading various patchwork news articles, some of which may be contradictory. The fact that basic openly accessible and comprehensive data is missing shows some inherent weaknesses in statements made about sanctions evasion and shows that there are likely unnecessary limitations in the ability to counter sanctions evasion. Without a robust dataset of sanctions evasion data that we can analyze, it is difficult to draw conclusions and find useful patterns about sanctions evasion. How can we be sure that we are doing what we can to prevent evasions from happening when we can't even see all of the relevant data?

In the year since Russia invaded Ukraine, the question of whether sanctions are an effective tool to coerce states towards "better behavior," has been at the forefront of policy discourse. The Economist Intelligence Unit's Agathe Demarais advises that "because countries have gotten wise to sanctions, and figured out how to pre-empt them, the West would be wise to look back at what has and hasn't worked when it comes to sanctions and devise a playbook

accordingly."[68] But that is impossible given the lack of organized and comprehensive data on cases of sanctions evasion. In 2014, then-President Barack Obama said of the newly imposed sanctions on Russia, "we don't yet know whether it's going to work."[69] Almost ten years later, not much has changed. That is why it is necessary to promote more research in this field and on this topic.

In a time when improving the efficacy of sanctions has never been more important, it is crucial to take measures to create more comprehensive and accessible data. The future of sanctions hangs in the balance, waiting for us to take the first step.

[68] Hirsch, P. (2023). Why sanctions don't work — but could if done right. *Planet Money Newsletter*. NPR. (11 April 2023).
[69] Aleksashenko, S. (2016).

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